

Research Report



Researcher Marilyn Steiner, of the Alberta Environmental Centre in Vegreville, is studying the use of predatory mites and other means to control western flower thrips. The thrips attack greenhouse cucumbers.

Farming for the Future 1988-89 awards

Popular agriculture research program nears 10-year mark

After funding about 1,000 research and demonstration projects and providing more than \$47 million in research funds, Alberta's Farming for the Future agricultural research program is fast approaching the end of its first decade.

It started its tenth year last April with another slate of new and renewed research projects worth about \$3.91 million. This funding has been divided among 100 projects in Farming for the Future's Research Program.

The general objectives of Farming for the Future are to support research which will increase the profitability and enhance the long-term productivity of Alberta's agricultural industry. In meeting these goals, Farming for the Future has funded research into all major segments of Alberta's agricultural sector.

"It has supported research which has led to improved crop varieties, new livestock vaccines, unique food products, hardy honey bee strains, and a whole range of alternatives for obtaining optimal returns from crop and livestock production," says Ben McEwen, chairman of the Farming for the Future Council and deputy minister of Alberta Agriculture.

Although much research support is directly related to producer concerns, the program has also funded considerable research of benefit to processors and consumers. Developments, either in use or in progress, include:

new packaging methods to increase the shelf life of some bakery products, better (and locally made) starter cultures for cheese manufacturers, faster ways of tenderizing beef, new techniques to reduce meat spoilage, and new methods to improve pork quality.

Research supported by Farming for the Future has addressed a great range of concerns: new ways to control diseases, weeds and insect pests; identification of export opportunities for Alberta food products; proper management of land, soil and water; the economics of farming; even various 'safety' questions, such as the proper clothing for chemical handling, how to remove residues from contaminated clothing, and how to predict hypersensitivity to bee stings.

Two funding vehicles are used to help research these concerns. The Research Program is geared toward supporting projects conducted by those who have the needed academic qualifications and professional experience to run full-scale research projects. Funds are awarded once a year. Including the 100 projects being supported this year, the Research Program has, in total, provided more than \$43 million to 515 projects.

The purpose of the On-Farm Demonstration Program, Farming for the Future's other funding vehicle, is to speed up the transfer of research findings from the scientific to the

farming community. Demonstration projects are cooperative efforts intended to introduce new information to producers. Each project combines the talents of producers, extension staff and specialists or scientists to ensure innovative technology is passed on to the agricultural community at large.

On-Farm Demonstration projects are submitted and approved throughout the year. In 1987-88, 133 projects were approved and awarded funding of \$541,000. In 1988-89, \$600,000 has been set aside for this type of activity.

"In addition to these on-farm demonstrations and our regular publications, we hope to initiate other systems of distributing the results of our research," says Dr. Yilma Teklemariam, secretary of the Farming for the Future Council. "Plans for this are still being drafted. However, by mid-1989, we hope to have two new systems in place." ❖

[Editor's Note: This is a special edition of Research Report. On the following pages are listed the projects being supported under Farming for the Future's Research Program during 1988-89. Next month, Research Report will resume its normal focus on individual projects.]

RESEARCH PROGRAM PROJECT SUMMARIES

1988-89

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
CEREALS AND OILSEEDS			
Breeding Regionally Adapted Canola Cultivars for Alberta Growing Areas • to develop high yielding, disease resistant canola cultivars adapted to the Peace River region and to southern Alberta	R.K. Downey	Agriculture Canada — Saskatoon	80,000
Evaluation and Development of Soft White Spring Wheats for Western Canada • to develop high yielding soft white wheats with good resistance to disease and sprouting	R.S. Sadasivaiah	Agriculture Canada — Lethbridge	77,000
Identification of Cold-Hardy, Snow Mold Resistant Winter Wheat Lines for Central and Northern Alberta • to screen and test lines of winter wheat, triticale and related grasses which are cold hardy and resistant to snow mold	D.A. Gaudet	Agriculture Canada — Lethbridge	34,000
Acceleration of Canola Variety Development for the Peace River and Southern Alberta Regions • to develop canola varieties adapted to the Peace River region, and to irrigated dryland conditions in southern Alberta	D.L. Woods	Agriculture Canada — Beaverlodge and Lethbridge	215,000
Intensive Management Systems for Barley, Wheat, and Canola Production • to determine the effects of fertilizers, plant growth regulators, pesticides and stand density on barley, wheat and canola yields	D.C. Penney J.H. Helm	Alberta Agriculture — Edmonton and Lacombe	70,000
Advancing Wheat Adaptability to Acid Soil Conditions, Especially in North Western Alberta • to evaluate the use of several sources of genetic resistance to soil acidity	P. Clarke	Agriculture Canada — Beaverlodge	37,000
Accelerated Development of Blackleg Resistant Canola for Alberta Using Biotechnology • to screen Australian blackleg resistant canola breeding lines and cultivars for adaptation to Alberta	B.J. Cardy	Biotechnica Canada Inc. — Calgary	58,000
Understanding and Alleviating Green Seeds in Spring Canola: Impact of Increased Early Frost Tolerance on Degreening • to assess frost tolerance during seed maturation in <i>Brassica napus</i> , <i>B. campestris</i> , and <i>B. juncea</i> , and to identify the superior lines	A. Johnson- Flanagan	University of Alberta — Edmonton	55,000
CROP PROTECTION AND ENTOMOLOGY			
Development of Improved Methods of Forecasting Grasshopper Distribution and Abundance • to determine the effects of critical weather factors on grasshopper populations, and to incorporate findings into an improved system of outbreak prediction and description	D.L. Johnson	Agriculture Canada — Lethbridge	38,000
Quackgrass Control in Zero and Conventional Tillage Systems • to assess the effects of precisely timed, low rates of glyphosate (Roundup) and sethoxydium (Poast) on quackgrass control	K.N. Harker W.H. Vanden Born	Agriculture Canada — Lacombe and University of Alberta — Edmonton	40,000
Improving Herbicide Efficiency on Quackgrass and Other Perennial Weeds Which Have Dormant Buds Using PGRs • to determine the effects of plant growth regulators (PGRs) on herbicide efficiency, and to test herbicide/PGR treatments	J.S. Taylor	Agriculture Canada — Lacombe	23,000
Evaluation of Protective Work Wear for Agricultural Workers • to test currently available and new work wear for effectiveness in reducing pesticide penetration	E.M. Crown	University of Alberta — Edmonton	33,000
Control of Chalkbrood Fungi in Leafcutter Bees • to test the effectiveness of fungicides for controlling chalkbrood disease	E. Simpson	Alberta Alfalfa Seed Producers Association — Tilley	50,000
Effect of Brown Wheat Mite on Barley in Southern Alberta • to gain information on overwintering, dispersal and the effect of cropping practices on population levels of the brown wheat mite, and to determine the feasibility of cultural and chemical control measures	J.R. Byers	Agriculture Canada — Lethbridge	49,000
Cultural and Chemical Control of Downy Brome in Winter Wheat • to determine the time of establishment and effect of soil moisture and temperature on emergence of downy brome in winter wheat, and to test potential herbicides for selective control of downy brome	R.E. Blackshaw	Agriculture Canada — Lethbridge	45,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
Feasibility of Long Term Grasshopper Management • to evaluate the use of bran baits treated with low quantities of insecticide or <i>Nosema locustae</i> in large areas to reduce grasshopper populations	M. Dolinski	Alberta Agriculture — Edmonton	52,000
Integrated Pest Management for Western Flower Thrips, <i>Frankliniella occidentalis</i>, in Greenhouse Cucumbers • to test the use of the predatory mite <i>Amblyseius cucumeris</i> , ground treatments, and pre-bloom pesticide treatments to control western flower thrips under Alberta greenhouse conditions	M. Steiner	Alberta Environment — Vegreville	50,000
Screening and Evaluation of Plant Diseases for Biological Control of Weeds • to evaluate known pathogens for use as mycoherbicides, and to continue to screen new material for pathogens	A.S. McClay	Alberta Environment — Vegreville	29,000
FORAGES			
Low Temperature Nitrogen Fixation for Alfalfa • to evaluate selected strains of Rhizobia bacteria for the ability to fix nitrogen in cool conditions	W.A. Rice	Agriculture Canada — Beaverlodge	50,000
Yield and Quality of Pasture Grasses During Initial Spring Growth and Fall Regrowth • to determine how plant maturity, structure, and shape are related to the yield and quality of various pasture grasses	V.S. Baron J.R. King	Agriculture Canada — Lacombe and University of Alberta — Edmonton	36,000
Feasibility of Double Cropping and Intercropping of Winter Cereals for Fall Pasture • to assess intercropping and double cropping of spring and winter cereals as a means of extending the grazing season	V.S. Baron D.F. Salmon	Agriculture Canada — Lacombe and Alberta Agriculture — Lacombe	49,000
Yield, Preservation and Nutritive Value of Moist Hay • to assess the effects of moisture content and preservatives on the quality of hay	G.W. Mathison	University of Alberta — Edmonton	44,000
Coating of Forage Legume Seeds with Rhizobium Inoculants • to improve the method of inoculating small-seeded legumes with nitrogen-fixing bacteria	W.T. Leps	Alberta Research Council — Edmonton	31,000
Fall Management of Three Orchard Grass Cultivars Under Simulated Intensive Grazing • to evaluate how the timing of late-season grazing affects the winter hardiness and spring regrowth of three orchard grass cultivars	J.R. King	University of Alberta — Edmonton	41,000
Restoration of Overgrazed <i>Festuca halli</i> Rangeland by Short Duration Grazing • to redirect research towards an investigation into the use of short duration grazing to restore over-grazed <i>Festuca halli</i> rangeland	A.W. Bailey	University of Alberta — Edmonton	15,000
IRRIGATION			
Irrigation Scheduling to Maximize Yield of Soft White Wheat Under Intensive Crop Management • to compare the effects of frequent irrigation over the entire growing season with irrigation applied only at critical times	J.M. Carefoot	Agriculture Canada — Lethbridge	33,000
Effectiveness of Interceptor Drains and On-Farm Grid Drains for Canal Seepage Control and Reclamation • to evaluate the relative effectiveness and cost of deep interceptor drains and shallow on-farm grid drains for canal seepage control	B. Galatiuk	CH2M Hill Engineering Ltd. — Calgary	44,000
Overshot Gate Discharge Characteristics • to determine the discharge characteristics of the overshot gate relative to gate position	J. Prozniak	MPE Engineering Ltd. — Lethbridge	20,000
Functional Study of Irrigation Turnout Gates • to develop cost effective and practical methods of reducing leakage and operational problems of turnout gates	H. Savage	Associated Engineering — Lethbridge	35,000
Evaluation of Single Delivery Flow Measurement Devices for Irrigation Application in Alberta • to develop and assess irrigation water metering devices for the individual farm turnout	J. Prozniak	MPE Engineering Ltd. — Lethbridge	51,000
Management Program for Optimizing Irrigation Reservoir Supply Levels • to develop a reservoir management routine which incorporates demands, upstream supply capability and reservoir through-flow routing	J. Byrne	University of Lethbridge — Lethbridge	10,000

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PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
LAND RESOURCES AND ENGINEERING			
Furrow Openers for Seed and Fertilizer Placement in Minimum Tillage Systems • to evaluate furrow openers for seed and fertilizer placement in terms of equipment design characteristics and economics	C.W. Lindwall	Agriculture Canada — Lethbridge	90,000
Effects of Crop Management Practices on Infiltration • to quantify the effects of agricultural management practices on soil moisture and temperature	D.S. Chanasyk	University of Alberta — Edmonton	15,000
Long-Term Influence of Tillage, Straw and Nitrogen on Soil Characteristics and Crop Yield • to evaluate the effects on crop yield of zero tillage versus conventional tillage, straw retention versus removal, and timing and method of nitrogen application	M. Nyborg	University of Alberta — Edmonton	49,000
Annual Legume Plowdown to Replace a Cultivated Fallow • to develop guidelines for the use of annual legume plowdown in order to maintain and improve soil nitrogen and organic matter levels	T.L. Jensen	Alberta Agriculture — Edmonton	53,000
Quantification of Soil Erosion in East-Central Alberta • to develop a predictive model to estimate soil erosion and deposition	R.W. Howitt	Alberta Research Council — Edmonton	28,000
Dryland Farming System Research for South and South Central Alberta • to develop an economic crop production system for the six soil areas in southern and south-central Alberta	R.H. McKenzie	Alberta Agriculture — Lethbridge	63,000
Field Mapping and Location Method Using Radio Signal Triangulation • to develop and test the microprocessor-based, digital-signal processing functions of a position-locating system for tractors and implements so that chemicals and fertilizers can be applied according to field requirements	J. Baker	Baker Electronic Enterprises Inc. — Edmonton	47,000
Maximizing Meadow Bromegrass Pasture Yield Through Optimum Fertilizer Nitrogen Management • to compare the efficiency of two N fertilizers (urea and ammonium) applied to meadow bromegrass in early spring, and to evaluate the influence of time of application on this efficiency	S.S. Malhi	Agriculture Canada — Lacombe	31,000
Information Management for Dryland Salinity Investigations • to develop a Geographic Information System which will assist in the investigation of dryland salinity situations, and to study the influence of regional, landscape and environmental parameters on the occurrence of dryland salinity	S.R. Moran	Alberta Research Council — Edmonton	42,000
Characterization of Airborne Dust Particles in Animal Housing • to quantify the rates of airborne dust (respirable and non-respirable), to characterize and identify airborne particles, and to characterize and identify the sources of dust	J. Feddes	University of Alberta — Edmonton	19,000
In-Bin Grain Moisture Monitoring • to test the feasibility of using soil moisture sensors to monitor the moisture content of grain in storage bins, and to establish whether the expansion/contraction of a grain mass can be used as a reliable indication of moisture content	J.J. Leonard	University of Alberta — Edmonton	18,000
Deep Tillage Tools for Soil and Water Conservation • to determine the effect of deep tilling on soil and water conservation, and to assess its long-term benefits	D.S. Chanasyk	University of Alberta — Edmonton	55,000
The Impact of Grazing on Rangeland Hydrology • to study the hydrologic impact of grazing on the sloped areas of the foothills fescue rangelands	D.S. Chanasyk	University of Alberta — Edmonton	46,000
Lessening the Economic Risks Associated with Nitrogen Fertilization of Cereals • to test the agronomic feasibility of various post-seeding methods of applying nitrogen in different soil zones	J. Ashworth	Norwest Soil Research Ltd. — Edmonton	40,000
NON-RUMINANTS			
The Effects of Prepubertal Nutrition on the Onset of Puberty and Ovulation Rate in Gilts • to investigate the influence of nutrition on age and weight at puberty and ovulation rate	F.X. Aherne	University of Alberta — Edmonton	35,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
Involvement of Diet in the Sudden Death Syndrome (SDS) in Broilers • to identify the dietary and environmental regimes associated with high incidence of sudden death syndrome in broilers	R. Blair	University of British Columbia — Vancouver	20,000
Meat Quality from Pigs Heterozygous for the Halothane Gene in Different Breeds of Pigs • to determine if the Halothane gene is expressed in meat colour and structure scores from pigs that are heterozygous for the Halothane gene	A.P. Sather	Agriculture Canada — Lacombe	50,000
The Influence of Mineral Content of Water and Feed on the Incidence of Egg Shell Defects • to identify specific minerals in water and feed that will cause an increase in egg shell defects	F.E. Robinson	University of Alberta — Edmonton	27,000
Influence of Dietary Fat Level and Composition on Protein Deposition in the Rapidly Growing Broiler • to assess the effects of diets varying in the level and composition of dietary fat on net protein and energy gain, and to assess the underlying rates of protein synthesis and degradation	V. Baracos	University of Alberta — Edmonton	35,000
Effect of Immunization of Gilts Against Paternal Antigens on Reproductive Performance • to determine how pre-immunizing young gilts against antigens from boars affects conception rate, ovulation rate and embryo survival	R.J. Christopherson	University of Alberta — Edmonton	46,000
Post-Weaning Nutrition of the Pig: Nutrient Interactions Among Dietary Components • to determine the optimum levels of digestible protein, amino acids, fat and fiber in diets of early-weaned pigs	W.C. Sauer	University of Alberta — Edmonton	44,000
The Effects of Nutrition on Embryo Mortality in Swine • to determine the effects of normal or high feed intake levels in early gestation on embryo mortality and sow weight loss during lactation, and to determine the hormonal profile of sows fed high or low levels during lactation and early gestation	F.X. Aherne	University of Alberta — Edmonton	35,000
Nutritional Significance of Biologically Enriched Egg Yolk with Omega-3 Fatty Acids • to develop eggs and egg products biologically enriched with Omega-3 fatty acids by including full-fat canola, flax seed or fish products in laying-hen diets	J.S. Sim	University of Alberta — Edmonton	39,000
PROCESSING AND MARKETING			
Immobilization Technology for Accelerated Canola Sauce Fermentation • to develop a technique that would reduce the costs and time needed to produce a canola-based substitute for soy sauce	B. Ooraikul	University of Alberta — Edmonton	42,000
The Role of Fertilizer, Weather and Fertilizer-Weather Interactions in Prairie Grain Production and Productivity • to analyze the effects of fertilizers and weather on grain production	T.S. Veeman	University of Alberta — Edmonton	35,000
Use of Biotechnology to Develop Innovative Systems for Preservation of Meats • to select and develop strains of bacteria that will inhibit spoilage and disease-causing bacteria in meats	M.E. Stiles	University of Alberta — Edmonton	41,000
Quality Evaluations of Antioxidant Treated Canola Oils • to study the storage and heat stability of canola oils treated with antioxidants and combinations of antioxidants	Z.J. Hawrysh	University of Alberta — Edmonton	40,000
Potential Dairy Sector Adjustments to the Widespread Adoption of Bovine Growth Hormone • to assess the effects of increased milk production on economic competitiveness in Alberta's dairy industry	K. Nicol	University of Lethbridge — Lethbridge	In Progress
Feasibility of Lactic Acid Starter Culture Production in Alberta • to evaluate various strains of bacteria used in cheese production in order to establish a starter culture industry in Alberta	M.E. Stiles	University of Alberta — Edmonton	33,000
A General Equilibrium Model of Alberta's Agricultural Sector • to develop a model of the Alberta economy emphasizing the agricultural sector, and to use this model to evaluate policy initiatives	M.B. Percy	University of Alberta — Edmonton	15,000
Development of a Method of Rapid Analysis of Bovine Milk Proteins Composition by High Performance Liquid Chromatography • to develop a method of rapid analysis of bovine-milk proteins composition using high performance liquid chromatography	L. Ozimek	University of Alberta — Edmonton	15,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
Export Markets for Canada's Foodgrains and Feedgrains • to assess the market prospects for Western Canadian barley and wheat in the balance of the 1980s	M.M. Veeman	University of Alberta — Edmonton	37,000
Farm Agricultural Data Sources and Needs, and Related Planning • to identify the present and potential agricultural and financial data needs of Alberta's agricultural researchers, policy-makers, managers and advisors	G.A. Mumey	University of Alberta — Edmonton	41,000
Incidence, Origin and Control of Pathogenic Bacteria in Raw Milk and Milk Products • to determine the incidence of pathogenic bacteria in the raw milk supply in Alberta (specifically <i>Salmonella</i> , <i>Listeria</i> , and <i>Campylobacter</i>) and the origin of pathogenic isolates, and to develop a strategy to limit the numbers of pathogenic organisms in raw milk and dairy products	H. Jackson	University of Alberta — Edmonton	15,000
Future Directions for the Alberta and Canadian Sheep Industry • to analyze the factors responsible for the decline in the Canadian sheep industry, and to identify the appropriate future direction for the industry	M.H. Hawkins	University of Alberta — Edmonton	15,000
Analysis of Sulfathiazole in Honey • to examine how ST (sulfathiazole) breaks down in honey, and to determine if disappearance of ST can be correlated with a loss of antibiotic activity	P. Sporns	University of Alberta — Edmonton	30,000
The Demand for Red Meats and Related Foods in Canada • to derive updated and more comprehensive estimates of the demand relationships for red meats and related foods in Canada, and to assess factors underlying changes in consumption patterns for red meats in recent years	M.M. Veeman	University of Alberta — Edmonton	24,000
Risk and Return to Beef Feeder Cattle Investments in Alberta • to determine the risk and return associated with beef feeder cattle as compared to alternative forms of investment, and to initiate a data series for future use	L. Bauer	University of Alberta — Edmonton	17,000
Identification of Key Factors Involved in the Decision Making Process Among Farm Operators in Alberta • to identify social/psychological and economic factors that influence farm decisions, and to assess the scope of influence of these factors	D.S. Gill	University of Alberta — Edmonton	18,000
RUMINANTS			
Vitamin E and Selenium Deficiency: Immunological Manifestations • to study the effects of vitamin E and selenium deficiencies on disease problems in livestock	B. Blakley	Western College of Veterinary Medicine — Saskatoon	29,000
Manipulation of Hormones in Calves to Improve Their Rate of Growth • to evaluate methods of immunizing calves against somatostatin (an inhibitor of growth hormone release), and to determine the effects of this immunization on calf growth rates and feed efficiency	G.J. Mears	Agriculture Canada — Lethbridge	45,000
Application of Infrared Thermography and Ultrasonography for Diagnosis of Reproductive Problems in Beef Bulls • to develop infrared thermography and ultrasonography as diagnostic tools in assessing reproductive characteristics of bulls	G.H. Coulter	Agriculture Canada — Lethbridge	25,000
Development of Digestion Enhancement Agents to Convert Supplemented Chemically-Treated Straw to Ruminant Feed • to test the effects of digestion-enhancing agents and supplements on the digestibility and nutritional quality of barley and wheat straws	K.J. Cheng J.W. Costerton	Agriculture Canada — Lethbridge and University of Calgary — Calgary	56,000
Effect of Rumen Microbial Metabolism on Selenium Requirements of Ruminants • to study the availability of selenium under different dietary regimes in order to more accurately determine selenium requirements	L.M. Rode	Agriculture Canada — Lethbridge	40,000
Mechanism Mediating Ruminal Stasis in Ruminal Lactic Acidosis (Grain Overload) • to develop treatments to restore forestomach motility lost due to grain overload and so reduce the severity of this condition	E.C. Crichlow	Western College of Veterinary Medicine — Saskatoon	24,000
Vaccines Against Viruses Causing Bovine Respiratory Disease • to reduce losses due to shipping fever by developing better vaccines and improving the animal's ability to fight off the disease	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	60,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
Factors Influencing the Efficiency of Protein (Amino Acids) and Energy Utilization by Dairy Cows • to study amino acid utilization in dairy cattle in order to more accurately determine feed requirements	J.J. Kennelly	University of Alberta — Edmonton	62,000
Endocrinological and Genetic Analysis of Superior Growth in Cattle • to characterize hormonal and genetic factors involved in growth regulation in cattle	R.K. Salmon	University of Alberta — Edmonton	25,000
Influence of Temperature on Protein and Amino Acid Digestion in Ruminants • to assess the effect of a cold environment on amino acid digestion, and to determine optimal dietary requirements in cold and warm environments	R.J. Christopherson	University of Alberta — Edmonton	30,000
Within and Between Breed Variation in Cold Hardiness of Cattle • to determine individual and breed variation in cold hardiness and metabolic capacity of calves	B.A. Young	University of Alberta — Edmonton	35,000
Studies on the Molecular Genetics and Endocrinological Basis of Muscle Growth in Double Muscled Cattle • to identify specific growth regulating genes that can be manipulated to enhance red meat production	M.A. Price	University of Alberta — Edmonton	20,000
Growth Hormone for Dairy Cattle-Mode of Action and Effect on Milk Production and Reproductive Performance • to determine the influence of growth hormone on milk yield and reproductive performance of dairy cows	J.J. Kennelly	University of Alberta — Edmonton	75,000
The Effect of Growth Hormone on the Intensity of Estrous Behavior in Lactating Dairy Cows • to determine the effect of growth hormone on onset, duration and intensity of estrus in lactating dairy cows, and to determine whether growth hormone alters systemic concentrations of estrogen during the periovulatory period	L.M. Rutter	Alberta Agriculture — Edmonton	18,000
Association of Respiratory Tract Colonization with Adherence of <i>Pasteurella haemolytica</i>-AI to Epithelial Cells • to determine if an association exists between colonization of the bovine respiratory tract by <i>Pasteurella haemolytica</i> and increased <i>in vitro</i> adherence of this bacterial species to bovine oropharyngeal epithelial cells	J.W. Costerton	University of Calgary — Calgary	24,000
Development of a Recombinant Vaccine to Bovine Rotavirus/Coronavirus • to develop and test recombinant DNA produced vaccines against rota and coronavirus infections, and to develop an oral delivery system for these vaccines	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	38,000
The Enhancement of Casein Production Through Genetic Manipulation of a Bovine Casein Gene • to increase milk's protein content by genetically engineering a highly active K-casein gene	R.K. Salmon	University of Alberta — Edmonton	35,000
Risk Factors for Mortality Due to Calf Scours • to identify factors that predispose beef calves to neonatal diarrhea and subsequent death	J.M. Naylor	Western College of Veterinary Medicine — Saskatoon	25,000
Evaluating the Economic Disadvantage of Feeding the Pregnant Feedlot Heifer • to determine the average daily gain and feed efficiency of pregnant heifers fed during the third trimester, the cost effectiveness of aborting heifers at approximately 150 days of gestation, and the effect of pregnancy on carcass characteristics and yield	G.K. Jim	Feedlot Health Management — Okotoks	30,000
Urease Inhibitors for Ruminant Animals • to confirm that urease inhibitors will inhibit urea degradation in the rumen, and to obtain dose response curves so that the optimum level of inhibitor can be estimated	G.W. Mathison	University of Alberta — Edmonton	24,000
Rates of Digesta Flow and Rumination in Cattle • to determine the importance of rates of passage and amount of chewing on voluntary intake, digestibility, and energy losses	G.W. Mathison	University of Alberta — Edmonton	35,000
Influence of Somatostatin on Cold Tolerance in Ruminants and Response to Somatostatin Antibodies • to determine the role of somatostatin in regulation of body temperature, energy, protein metabolism and digestion in different environmental conditions, and to determine whether treatment with antibodies to somatostatin will improve cold tolerance of the newborn and growth and feed efficiency in cold environments	R.J. Christopherson	University of Alberta — Edmonton	30,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION & LOCATION	FUNDING AWARDED
Factors Affecting the Accuracy of Bull Evaluation for Gain in Bull Test Station <ul style="list-style-type: none"> to estimate the minimum length of test period needed for proper evaluation of weight-gain potentials of bulls, and to quantify the relative importance of age, birth weight, initial weight, age of dam, et cetera on variation in weight gain 	M. Makarechian	University of Alberta — Edmonton	5,000
Comparison of Natural Service Fertility of Yearling and Two-Year Old Bulls <ul style="list-style-type: none"> to compare the fertility of bulls under different breeding pressures 	M. Makarechian	University of Alberta — Edmonton	6,000
SPECIAL CROPS			
Safflower Management for Optimizing Yield and Quality <ul style="list-style-type: none"> to evaluate safflower management techniques in order to prepare a detailed safflower production package 	H.H. Muendel B. Roth	Agriculture Canada — Lethbridge and Alberta Agriculture — Lethbridge	55,000
Control of Bacterial Ring Rot and Blackleg Symptomless Infections of Potato <ul style="list-style-type: none"> to study the symptomless phases of two potato diseases to determine the conditions necessary for their occurrence 	S.H. DeBoer	Agriculture Canada — Vancouver	42,000
Increasing Tuber Yield by Manipulating the Physiological Age of Potato Seed Tubers <ul style="list-style-type: none"> to investigate the effects of storage temperature on tuber yield, grade and earliness 	N.R. Knowles	University of Alberta — Edmonton	65,000
Agronomic Studies Emphasizing Uniform, Earlier Establishment, Maturity and Adaptability of Cool Season Pulse Crops <ul style="list-style-type: none"> to study agronomic practices for improved production of lentils, peas and fababeans 	R. Gaudiel	Alberta Agriculture — Brooks and Lacombe	48,000
Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta <ul style="list-style-type: none"> to determine agronomic practices for commercial production of herbs and spices in Alberta 	R. Gaudiel	Alberta Agriculture — Brooks	21,000
Disease Elimination in Potato Breeding Clones <ul style="list-style-type: none"> to develop a source of disease-tested seed of clones included in the regional trial system of the potato breeding program 	D.R. Lynch	Agriculture Canada — Lethbridge	50,000

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Farming for the Future is administered by the *Farming for the Future Council*. The Council has 15 members, including producers, scientists and provincial and federal government representatives. Further information about the Council or about *Farming for the Future* can be obtained from Alberta Agriculture, Research Division, #202, 7000-113 Street, Edmonton, Alberta, T6H 5T6